4-H Science Enrichment Education for Kids (SEEK) and NatureMapping Program

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Program of Distinction Category

- Leadership Development
- Natural Resource Education
- Science Engineering & Technology
- Health & Fitness
- Health Relationships, Good Decisions
- Youth Decision-Making

Sources of Funding that Support this Program

- University of Arkansas Cooperative Extension Service
- Arkansas Game and Fish Commission
- Arkansas Department of Environment Quality
- Registration Fees

Program Content

Knowledge and Research Base

Each home schooled student is required by state law to be tested after grades 5, 7 and 10 for grade appropriate skill comprehension. Each instructor designs the curriculum for their class based upon the Arkansas science curriculum frameworks. The content strands of the Arkansas science curriculum frameworks, which we strive to meet, correlate directly with the objectives of the education reform topics of inquiry and problem solving, real-world learning experiences, project based learning, team building, group decision-making, and interdisciplinary study.

Specific lessons and activities are drawn from sources such as NatureMapping, Project WILD, Project Learning Tree, Project WET, Wonders of Wetlands, Project Underground, national and state 4-H and Cooperative Extension Service curriculum, as well as grade appropriate school texts. Professionals and specialists from our extensive 'Partnerships and Collaborators' list are invited each year as guest instructors to many of the classes. SEEK, like the Cooperative Extension Service, engages in the mission of bringing research-based information to its audience.

Research supports material from national wildlife and natural resource curricula as an effective education tool. In Wisconsin, Gilchrist (1998, p. 2) found that "Students exposed to Project WILD know more about selected wildlife concepts than

students who were not exposed to Project WILD" and "Students exposed to Project WILD know more about wildlife-related concepts than they did before exposure to Project WILD." A study completed for a masters thesis by Kathryn Frank (2000), entitled "Connecting with nature: A study of the effects of the NatureMapping program on its grade school participants, their schools and their communities," demonstrated positive effects of the NatureMapping program on students, especially those that did not excel in the classroom. "To a lesser degree, the teachers and community members said that the students learned about their communities and agencies, about the impacts human activities have on nature, how to ask questions, and how to analyze and communicate results" (Frank, 2000, p. 100).

Research in the area of home schooling has mostly centered around two areas: academic achievement of home school students compared to their public school counterparts and socialization levels of home schooled children. Ray and Wartes (as cited in Latham, 1998) found that home schooled children have been found to perform academically at a level equal to or higher than the conventionally schooled population. SEEK strives to support and enhance the academic levels of the home schooled audience.

In a meta-analysis, Scales and Roehlkepartain (2003, p. 9) state that asset-based (life skill) approaches to education "may actually have as much or more positive impact on academic outcomes in the long run as more obvious and traditional strategies for boosting achievement." Research such as this supports the life skill development component of SEEK.

Research in the area of socialization among home school students suggests that they are socio-emotionally well developed. Medlin (2000, Conclusion section) found that "home schooled children are taking part in the daily routines of their communities" and that "[parents] actively encourage their children to take advantage of social opportunities outside the family." Our SEEK program is one of the opportunities for this audience to take part in and continue to develop socially.

Finally, Lieberman and Hoody (1998, p. 2) found that students learning in an "environmentally integrated context," such as SEEK, learn more effectively than within a traditional education framework. They found that learning in an environmentally integrated context "appeared to significantly improve student performance in reading, writing, math, science, and social studies." The SEEK program blends this environmentally integrated context concept with academic and life skill development aspects.

Needs Assessment

A formal needs assessment prior to the pilot year of the program was not conducted. However, the idea for the program was suggested by a home school parent and in 1999, an initial presentation was made at the annual meeting of the Home Educators of Greater Little Rock Association to explore interest in a supplemental science-based program for 3rd-8th-grade home schooled students. Since the SEEK program began, a basis for need was suggested in three areas: parent feedback, participation, and potential audience growth. In surveys following the first year, parents indicated the following benefits: the program offered supplemental science resources they did not have, their child thought the science section of the Stanford Achievement Test was easier after participating in SEEK, and the science was taught "in action" at a level their child could understand and remember.

Evidence of audience need may be supported by attendance which quadrupled from year one to year three. The goal for the maximum number of students for the pilot year was 30. Interest in the program was great and 41 students were involved. The following year, the same format was replicated and enrollment increased to 78 students. The third year the program was expanded to include 1st-8th-grade and enrollment more than doubled to 153 students. A High School-age NatureMapping class and another High School class was added for the fourth year and enrollment increased to 180. The fifth, sixth, and current year's enrollment has been approximately 182, 195, and 201 respectively.

In Arkansas as well as nationally, the home schooled student audience is growing. Home schooled students represent an increasing percentage of students with diverse reasons for leaving public or other schools in the United States each year. The Department of Education in 2003 estimated the population to be 2.2 %, while Brian Ray of the National Home Education Research Institute estimated it to be 4.2 % (Beato, 2005). The Education Alliance (Other Questions section) states "The number of home school students increases each year. At the end of the 2004 school year, over 13,000 students were enrolled in Arkansas home schools."

Goals and Objectives

Goals

(1) Meet the science education needs
(2) Meet the life skill development needs of home schooled youth.

Objectives

(1) Incorporation of experiential science-based activities to cover the Arkansas science curriculum frameworks requirements of physical systems, life science systems, and earth/space systems
(2) The use of 4-H life skill based experiential activities and NatureMapping curriculum.

Target Audience

SEEK/NatureMapping students are home schooled students living in the Central Arkansas area, primarily from Pulaski, Saline, and Faulkner counties. In Arkansas, these three counties hold 1/5 of the state's population. These home schooled youth are from a variety of geographical settings including rural, small town, suburban, central city and urban. We have served approximately 200 students in first through twelfth grades for each of the last three years. Our maximum program population is 210 students.

Program Design and Content

Type of program

SEEK is a 12-week experiential science based program for home schooled students. NatureMapping is a data collection and monitoring program for schools and the public to keep track of nature by mapping what they observe.
The program type could be designated as part special interest, part 4-H enrichment, and part school-age child care education program.

Methods used to deliver the program

The SEEK/NatureMapping program is delivered three days a week through a 12-week winter session where individual students attend one day a week. The daily schedule runs from 9:00 a.m. to 2:30 p.m. and includes interactive, experiential education programming. The 1st- and 2nd-grade classes are held independently; however, we combine the 3rd- and 4th-grades, 5th- and 6th-grades, and 7th- and 8th-grades. A High School age biology or zoology/botany class is held on alternating years and a NatureMapping class is offered each year. Classes are conducted indoors and outdoors incorporating the grade appropriate academic science frameworks as well as the life skill development components. The program is conducted at the Arkansas 4-H Center 10 miles west of Little Rock in Pulaski County.

Curricula and/or educational materials

The 4-H Targeting Life Skill Model and SEEK/NatureMapping experiential environmental education program integrate critical thinking, problem solving, decision-making, goal setting, and teamwork skills as well as teaching multi-disciplinary academic classes utilizing the outdoors as a learning lab. As stated in the Knowledge and Research Base section, specific lessons and activities are drawn from sources such as NatureMapping, Project WILD, Project Learning Tree, Project WET, Wonders of Wetlands, Project Underground, national and state 4-H and Cooperative Extension Service curricula, as well as grade appropriate school texts. Specific activities and lessons are chosen based on grade level, subject matter, and the academic content standard being covered. Environmental education grant guidelines issued by the EPA strongly encourage using existing environmental education material.

Partnerships or collaborations

Partners include the University of Arkansas, Division of Agriculture, Cooperative Extension Service, Arkansas Game and Fish Commission, Arkansas Department of Environmental Quality, the Arkansas 4-H Foundation, C. A. Vines Arkansas 4-H Center, and the 4-H RES-Q and Excel programs. Prior year partners and sponsors have included: the U. S. Forest Service, the Environmental Protection Agency, and Arkansas Forestry Commission. Professionals from the following organizations routinely present to SEEK classes as guest instructors: Arkansas State Parks, Arkansas Game and Fish Commission (Wildlife Management, Education and Outreach, Fisheries, and NonGame Divisions) Arkansas Natural Heritage Commission, Arkansas Forestry Commission, Arkansas Department of Environmental Quality, Arkansas Cooperative Extension Service, Arkansas Geological Commission, and the University of Arkansas Little Rock. The Home Educators of Greater Little Rock Association has worked with the SEEK program by promoting it in their student yearbook for the past six years, printing articles in their newsletter, and including the SEEK program in their annual promotional event.

Professionals presented hands-on sessions to the High School NatureMapping class approximately 10 of the 12 weeks. SEEK students in grades 1st-8th typically have two to three guest speakers throughout the session and will take one field trip away from the Arkansas 4-H Center.

Program Evaluation

Process

In order to evaluate the program's implementation, parent, student, and instructor feedback from the previous year has primarily been utilized. As a result of past process evaluations, changes have been made to the program such as reducing the length from 14 to 12 weeks, adding a 1st grade class, and adding more options for High School age students. Due to parent and instructor feedback, risk management actions such as drop-off and sign-out procedures, insurance, and health, media, and activity permission procedures have been enhanced each year. The registration process has also been improved due to parent and instructor feedback.

Outcomes and Impacts

A pre- and post-test have been conducted since the first year of SEEK (Appendix B). A pre-test is administered during the first or second day of class prior to engagement in learning activities and a post-test is given at the conclusion of the learning activities. Test score data for the past six years are currently being analyzed. The most complete data are for all six years of the 3rd-4th-grade comprised of 202 tests. All six years combined result in an average pre-test score of 53.08 and an average post-test score of 92.35, with an average positive change of 39.26 for the 3rd-4th-grade class. The 5th-6th-grade classes have five years of data comprised of 164 tests. The average 5th-6th-grade pre-test score is 66.38 and post-test is 89.55, with an average change of 23.00 points. The 7th-8th-grade data are represented by 138 students tested over five years. The average pre-test score is 54.63 with an average post-test score of 75.76 and an average change of 21.46 points.

Communication to stakeholders

Each year an impact report, which includes the number of students enrolled in the program, contact hours, and testing data, is sent to the Arkansas Game and Fish Commission and Arkansas Department of Environmental Quality. The NatureMapping class has prepared a presentation for the Arkansas Game and Fish Commission for the past three years and has been invited twice to present at a Commission Board meeting. The EPA awarded an environmental education grant to the SEEK/NatureMapping program for the 2004/2005 session and a grant report is currently being compiled.

Program Sustainability

At this time, approximately 68% of program costs are being recovered through a registration fee. The remaining program costs must be raised each year through contract support agreements, grants, and awards. Funding has been sustained for six years and will be secured for the foreseeable future. The audience numbers and interest each year suggests a sustainable number of students to participate in the program. The interest and popularity of home schooling seems to be growing also. The curriculum for each grade level is rotated every year and repeated the third year so students receive new information if they return one year or several years.

According to the Education Alliance, the number of home school students is increasing every year with more than 13,000 at the end of the 2004 school year in Arkansas with 1716 from Pulaski, 616 from Faulkner, and 406 from Saline County. Thus the target audience needed to sustain the program appears to be strong and growing.

Replication

This program may easily serve as a model for replication in any city and any state. Three main factors would dictate the ease of reproduction: audience size, proximity to the teaching site, and facility resources. Any urban area with a somewhat organized home schooling population is ideal for an enrichment program. Many home education associations have websites and directories to assist in marketing to the home schooled audience.

The teaching site should be centrally located if possible for optimal attendance. Ideally, the facility would contain several meeting areas to accommodate classes. Access to natural features such as forests, fields, streams, lakes and ponds will also facilitate easy replication. The Arkansas 4-H Center is composed of 228 acres, with many excellent teaching areas both indoors and out. The Center is also located in a central area to Little Rock and other surrounding towns and communities. However, participants have attended the program from as far as 150 miles away.

Rationale and Importance of Program

In today's growing world and expanding global community, it is essential that young people understand the importance of environmental education and conservation. The adoption of innovative programs has always been a key component of the 4-H Program. SEEK and NatureMapping play a valuable role in environmental education by bridging the gap between students and scientists.

Numerous underserved, home schooled, urban as well as rural school-age children may lack a rich, personal connection to their environment. Today, much of their outdoor experiences take place via television and videos. With limited opportunities to interact with the natural world, positive environmental attitudes and behaviors suffer. If younger generations do not develop this connection, they will not feel a sense of appreciation and responsibility toward the care of our natural resources.

The University of Arkansas Division of Agriculture, Cooperative Extension Service, 4-H Youth Development Section has a responsibility to its youth to teach them about our environmental resources and how nature truly works. There needs to be an understanding that trees and wildlife are renewable resources when we sustain a suitable habitat. In 2003, the National 4-H Council fit environmental stewardship into its mission. They state, "caring for the environment is one of the most exciting challenges facing our young people today. But more than their enthusiasm is needed. Real care for the environment demands development of the broad view and a range of competencies…[using] developmentally appropriate activities designed to develop critical thinking and leadership skills." Youth are the future and they must have the skills necessary to be good stewards of the environment as well as leaders of themselves and their communities.

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